

## Hypospadias—Adult Complications and Concerns after Pediatric Repair

**Learning Objective:** At the conclusion of this continuing medical education activity, the participant will be able to define the incidence of short- and long-term postoperative complications after hypospadias repair, identify expected long-term urinary and sexual function outcomes after hypospadias repair and describe the evaluation and management of adult patients presenting with complications after pediatric repair.

This AUA Update aligns with the American Board of Urology Module on Core/General Urology. Additional information on this topic can be found in the AUA Core Curriculum sections on Reconstructive Urology and Sexual Medicine and Andrology.

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**KEY WORDS:** hypospadias, outcomes, complications, function after hypospadias, adults

INTRODUCTION

Hypospadias is one of the most common congenital anomalies in boys, with a prevalence of 1 in 150 to 300 live births.<sup>1</sup> The classic triad of hypospadias includes a dorsally hooded foreskin, an ectopic urethral meatus and ventral penile curvature. In its mildest form, with a meatus within glans and no chordee, surgical intervention can potentially be avoided with minimal functional impairment. In more severe variants, however, sexual and voiding function can be significantly impaired. If uncorrected, adults can suffer from shorter penile length, painful erections and an inability to direct urine stream which can be debilitating and lead to poor body image.<sup>2,3</sup>

Although now considered an oversimplification, the traditional classification system was based on the location of the urethral meatus. **Using this criteria, the majority of boys (70%–85%) with hypospadias have a distal variant while 10%–25% have a more severe proximal hypospadias.** In addition to the location of the meatus, the degree of penile curvature, degree of glans anomaly and associated shaft skin deficiencies have emerged as important considerations, and correlate with complication development (fig. 1).<sup>4,5</sup>

**The goals of penile reconstruction in patients with hypospadias are to allow the boy to void upright with normal velocity and laminar flow, to obtain satisfactory sexual function with a straight penis and, from both a cosmetic and reproductive standpoint, create an orthotopic meatus with a well-approximated glans.** The phenotypic heterogeneity of the hypospadias complex makes achieving these goals a unique challenge for the surgeon.

Over the past 50 years there have been numerous notable technical advances in hypospadias repairs, vastly improving postoperative appearance and function. Procedures such as the meatal advancement and glanuloplasty, glans approximation procedure and tubularized incised plate urethroplasty have all contributed to the reported high success rates in distal hypospadias repairs. Compared to distal hypospadias, proximal repair has less satisfying outcomes, with a higher incidence of complications and need for reoperation in adolescence and adulthood. A subset of boys having undergone repairs as children will continue to have urological issues throughout adulthood. Understanding the ramifications that childhood hypospadias repair has on adult urinary function, sexual function and fertility potential is critical to appropriately counsel and manage these complex patients. In the United States it is estimated that hypospadias occurs in 1:200 male births. Although not all undergo surgical intervention, the cumulative number of patients with a prior hypospadias warrants an understanding for the adult urology practice.

SURGICAL OUTCOMES AND COMPLICATIONS

**Distal hypospadias repairs have a reported success rate of 85%–95% while proximal repairs have a higher complication rate, ranging from 35%–68%.<sup>6–10</sup>** Urethrocuteaneous fistula, glans dehiscence, meatal stenosis, recurrent chordee,

|                                                                      |
|----------------------------------------------------------------------|
| Glans (G) Score:                                                     |
| 1. Glans good size; healthy urethral plate, deeply grooved           |
| 2. Glans adequate size; adequate urethral plate, grooved             |
| 3. Glans small in size; urethral plate narrow, some fibrosis or flat |
| 4. Glans very small; urethral plate indistinct, very narrow or flat  |
| Meatus (M) Score:                                                    |
| 1. Glanular                                                          |
| 2. Coronal Sulcus                                                    |
| 3. Mid or Distal Shaft                                               |
| 4. Proximal shaft, penoscrotal                                       |
| Shaft (S) Score:                                                     |
| 1. No chordee                                                        |
| 2. Mild (< 30°) chordee                                              |
| 3. Moderate (30 - 60°) chordee                                       |
| 4. Severe (> 60°) chordee                                            |

Figure 1. Glans meatus shaft scoring criteria for hypospadias.<sup>4</sup>

stricture disease and diverticula are the most common complications that require surgical repair.

The most common complication after hypospadias repair is urethrocuteaneous fistula, with an incidence of approximately 10% in short-term followup.<sup>6</sup> Causes of fistula are multifactorial and can be a result of turbulent flow, obstruction, infection or hematoma, as well as technical factors including tissue ischemia and misalignment of epithelial edges. **Although fistulae are typically noted within the first year after a repair, diagnosis can be delayed until parents observe the stream during toilet training or even until after puberty.** Management of fistulae depends on the number, size and location. If located below the ventral glans closure a primary repair can be attempted. In more complex cases, particularly at the coronal margin or more distal, redo urethroplasty achieves the best result.

**Glans dehiscence is most commonly identified in the early postoperative period.** It usually results from undue tension on the glans closure causing tissue ischemia and poor healing. The meatus typically retracts back to the corona. **Reoperation is not necessary in all cases, but bothersome voiding symptoms such as a weak or deflected stream, spraying or the need to sit to void can be used as indicators for intervention.**

Meatal stenosis may occur when the neomeatus is extended too far into the glans or there is a technical issue with incomplete glans wing dissection. Meatal stenosis associated with stranguaria, retention or a weak stream warrants repair. Conservative management includes topical steroids and in-office meatal dilation. When these fail, a meatotomy or re-do urethroplasty can be performed. The significance of a narrow meatus in the absence of symptoms is unknown and can improve as the child progresses through puberty.

Urethral stricture varies in its timing to presentation. Strictures can occur either at the junction of the native and neourethra, within the neourethra or within the glans. Management depends on the caliber, location and length of the stricture. For wide caliber short (<1 cm) strictures, dilation or direct vision urethrotomy can be considered, although this is often unsuccessful. In more severe cases, or after failed endoscopic

**ABBREVIATIONS:** uroflowmetry (UF), urinary tract infection (UTI)

intervention, revision urethroplasty with buccal mucosal graft or local skin flaps is typically required.

Urethral diverticula can usually be diagnosed on physical examination by having the patient void. Symptoms may include post-void dribbling, weak stream, a ventral penile bulge with voiding or urinary tract infection (UTI). Diverticula are more common after preputial flap repairs, 2-stage repairs and proximal repairs. **After proximal repairs the neourethra lacks the natural reinforcement of spongy tissue, predisposing it to stretch during higher pressure voiding, which with time may lead to diverticulum formation.**<sup>11</sup>

**Many patients with proximal hypospadias also have associated ventral curvature and at least half of these boys have curvature >30 degrees.**<sup>12</sup> **Correction of curvature, at the initial operation, is critically important to ensure adequate sexual function as well as a cosmetically pleasing result.** Curvature can be due to corporal disproportion, inadequate urethral length or the dysplastic nature and paucity of ventral shaft skin.<sup>13,14</sup> It is imperative that the degree of curvature be objectively measured via artificial erection in the operating room for all patients with proximal hypospadias as ventral curvature is not always readily apparent to caregivers or practitioners in the office. In one retrospective case series of patients presenting with complications after proximal hypospadias repair, 37% of caregivers did not mention issues with curvature during consultation yet the patients were found to have significant curvature during their procedure.<sup>13</sup> Men with mild curvature (<30 degrees) after hypospadias repair can typically be managed with dorsal plication similar to men with mild forms of Peyronie's disease or congenital penile curvature. However, those with moderate to severe curvature should be managed with a ventral lengthening procedure. In a retrospective review of 100 patients, Braga et al found that on multivariate analysis recurrent ventral curvature was more common after proximal hypospadias repair with dorsal plication technique compared to a ventral lengthening repair (9.4% vs 27.9%, respectively).<sup>15</sup> Curvature may recur many years after initial repair, specifically at puberty when there is growth of the phallus. **For the adult urologist, consideration should be given to underlying recurrent curvature with the development and assessment of any urethral complication.**

Recognition of the aforementioned complications after hypospadias repair requires adherence to extended followup. Faasse and Liu examined the role of followup on early and late complications and found that in their series 50% of patients who experienced late complications (>12 months) were not seen past 3 months after surgery and 33% were instructed to follow up as needed.<sup>16</sup> **Lucas et al performed a retrospective review of 1,280 patients undergoing hypospadias repair and found that 53% of complications occurred after the first year of followup and as many as 7%–17.5% of complications occurred more than 5 years postoperatively.**<sup>17,18</sup> It remains unclear whether late complications represent the true natural history of hypospadias repair or if delayed complication is due to lack of appropriate followup. Regardless, surgeons should attempt to follow patients through puberty, identifying individuals at high risk for complication development for transition to an adult urologist.

*Urinary function.* Urinary function. Assessing postoperative urinary function is critical in the followup of patients after hypospadias repair. **Even when free of anatomical obstruction, the inherent inelasticity and poor compliance of the neourethra can have drastic impacts on urinary flow parameters.** After surgical repair many patients have normal maximum urine flow rate (Q<sub>max</sub>) values on UF, however the majority of these curves are still below the 50th percentile compared to age matched controls. The impact is based on the principles of Poiseuille's law—resistance to flow in a cylindrical tube is proportional to the length of the tube and the radius to the fourth power. As the length of the inelastic neourethra increases, the effects on flowrate become more profound.<sup>11</sup>

Office uroflowmetry (UF) in both pediatric and adult urology practices is inexpensive, easy to complete and minimally invasive. Assuming the majority of hypospadias patients have normal bladder contractility, flowrates and flow curves can be used as a surrogate for urethral function. The few studies that have examined UF preoperatively in hypospadias patients have found variable results. The incidence of obstructed (<fifth percentile) flowrates or plateaued curves ranged from 6%–31% compared to 0%–3% in age matched controls.<sup>19</sup> It is unclear if patients should be followed with yearly UF or only if symptomatic, but consideration to a regular regimen should be given to higher risk patients.

For distal hypospadias repairs, reported obstructive flowrates range from 15%–33%.<sup>20,21</sup> Findings of obstructed flow are even more common after proximal hypospadias repair. In one study, Andersson et al found obstructive flow rates in 75% of patients after proximal tubularized incised plate repair at 1 year postoperatively.<sup>22</sup> This spontaneously improved to within a normal range in 33% of boys at 7 years' followup. **Postoperatively, borderline or obstructed flow rates tend to improve over time and therefore should be observed in the absence of lower urinary tract symptoms.** The significance of low flowrates in asymptomatic adults after hypospadias repair in childhood remains unclear; however, those with abnormal or borderline flowrates warrant closer long-term followup.

Hypospadias repair technique can also play a role in postoperative urinary function parameters. For example, in the repair of proximal hypospadias with severe chordee, a 2-stage free graft repair shows significantly higher and more durable Q<sub>max</sub> and average urine flow rate (Q<sub>ave</sub>) values compared to a preputial onlay flap repair.<sup>21,23</sup> The clinical implications of these observed improvements in flow remain controversial and longitudinal studies across various age groups will be required to determine their significance.

Clinically, adult patients may present with a variety of lower urinary tract symptoms including slow/weak stream (15.1%), spraying or splayed stream (30%) and post-void dribbling (29.6%).<sup>2</sup> **In a review article, Rynja et al reported that patients having undergone hypospadias repair reported lower urinary tract symptoms twice as often compared to controls.**<sup>2</sup> In these patients with significant bother, the integrity and patency of the neourethra should be investigated to rule out pathological causes such as urethral stricture, diverticula and meatal stenosis which may require surgical re-intervention.

**Sexual function.** Surgeries we perform for hypospadias during infancy can have lasting effects on sexual behavior and self-esteem throughout adolescence and adulthood. Multiple operations, persistent curvature or poor aesthetic outcomes can have a negative impact on the long-term sexual functioning and satisfaction of our patients.

Early studies reported that patients with hypospadias were less sexually active and made their sexual debut later in life. **More recent literature suggests the opposite, with sexual debut, interest in sex, libido and satisfaction with sexual experiences in hypospadias patients being comparable to age-matched controls.**<sup>24–27</sup> Although obtaining accurate, generalizable data is difficult with the current literature, which is limited by small cohorts, analysis of outdated surgical techniques and use of nonvalidated questionnaires, these data are promising and suggest that these patients as a whole do well.

From a surgical perspective, every effort is made to preserve the integrity of erectile function. In both the ventral lengthening and dorsal plication repairs, the neurovascular bundles are avoided and erectile bodies preserved. This, in theory, ensures excellent erectile function and glanular sensation later in life.<sup>28</sup> It is obvious then that technical errors during these complex repairs can lead to potential sexual dysfunction and dissatisfaction in adulthood.

In the current literature the prevalence of erectile dysfunction after hypospadias repair is difficult to interpret. Male erectile function is multifactorial with various medical, social and psychological factors playing equally important roles (fig. 2). When considering all hypospadias repairs, multiple studies have shown that there is no difference in erectile function between hypospadias patients and controls.<sup>29–32</sup> **However, it is important to**

**note that patients with a history of proximal hypospadias repair have a 2 to 4-fold increased risk of mild to moderate erectile dysfunction compared to distal repairs. Furthermore, approximately a third of patients with a history of multiple failed repairs suffer from erectile dysfunction.**<sup>33–35</sup> The majority of these patients respond to oral pharmacological therapy. In one retrospective review of 100 patients who had multiple failed hypospadias repairs by Husmann et al, 62% (23/37) of patients with moderate to severe sexual health inventory for men (SHIM <17) erectile dysfunction responded to an oral phosphodiesterase-5 inhibitor. The severity of erectile dysfunction correlated to a patient's ability to respond to treatment with 92% of patients with moderate erectile dysfunction (SHIM 11–16) responding to oral phosphodiesterase-5 inhibitor therapy compared to only 46% with severe erectile dysfunction (SHIM <11).<sup>35</sup>

Although no validated erectile dysfunction questionnaires exist for this population, the International Index of Erectile Function, Global Sexual Function and Pediatric Penile Perception Score have been used as surrogates. In recent studies patient dissatisfaction, as it relates to sexual function, appears to stem from the perception of decreased penile length. Rynja et al reported that patients who underwent proximal hypospadias repair had a significantly shorter mean stretched penile length compared to age matched controls (10.8 cm vs 12.1 cm). Those men having undergone a distal repair had no difference in penile length compared to controls. In this study, perceived decreased penile length was the most influential factor when dissatisfaction with cosmesis and erectile function was reported.<sup>31</sup> Although penile length is not generally considered a correctable surgical condition, in the pediatric hypospadias repair, ventral lengthening has been shown to add up to

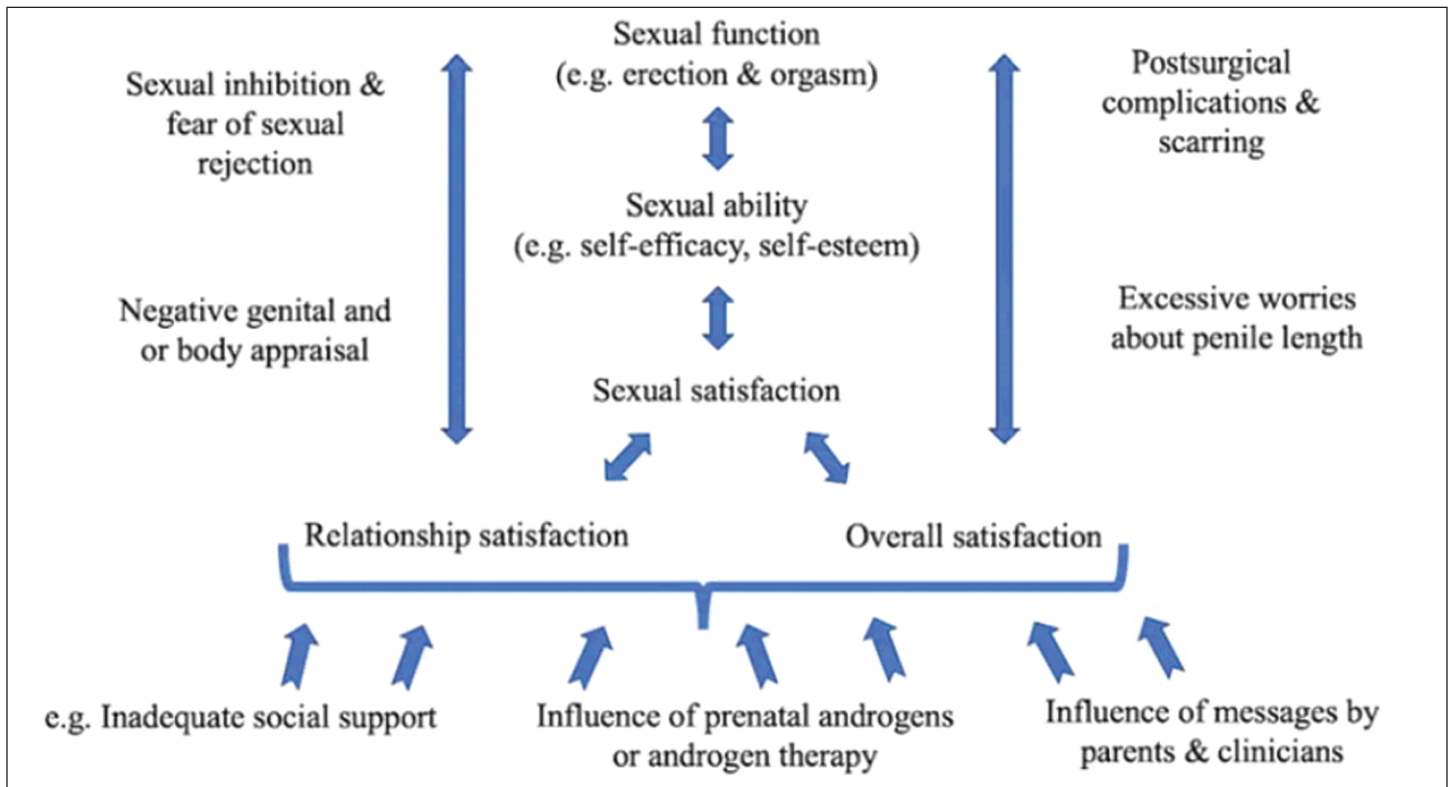


**Figure 2.** Dynamic model of sexual quality of life within biopsychosocial framework in men with hypospadias.<sup>50</sup>

1.5–2 cm of length at the time of surgery. As this technique becomes utilized more frequently in patients with proximal hypospadias and severe chordee, we must examine the degree of impact it has on adult penile length. **Adult urologists should be aware of the patient concerns for decreased penile length and its potential impacts on psychosexual behaviors in order to appropriately counsel patients and families.**

Positioning the meatus in an orthotopic location within the glans has always been of critical importance to the surgeon during hypospadias repair. Recent literature suggests surgeons place greater emphasis on this outcome than patients do. **In a recent review by Andersson et al, all patients were either “satisfied” or “very satisfied” with meatal position despite only 11% having a distal glanular meatus.**<sup>28</sup> Furthermore, in a study of women rating penile appearance, meatal position was rated the least important factor.<sup>33</sup> Patients and their partners seem to be far more satisfied with penile appearance than surgeons.<sup>29,36</sup> Surgeons are often their own harshest critics and what is imperfect to the surgeon may be a satisfactory and acceptable outcome for patients and their partners, who should be the ultimate authority in achieving a successful repair.

Although orgasmic function is typically preserved, issues with ejaculation can plague hypospadias repairs. In one study 12.3% of patients who underwent hypospadias repair as a child reported issues with ejaculation.<sup>28</sup> Post-orgasmic milking of the urethra to express ejaculate can be quite common, particularly in patients with a long reconstructed neourethra. To date, no effective surgical procedure exists to restore projectile ejaculatory function in these patients. **Anejacuation can be related to either the nonphysiological neourethra, bladder neck incompetence or a persistent prostatic utricle.**<sup>29</sup> A prostatic utricle is an embryological remnant of the müllerian duct and is more common in boys with proximal hypospadias with an incidence of 11%–14%. In these cases excision can potentially restore ejaculatory function, however the operation can be difficult given its proximity to the vas deferens, pelvic nerves, rectum and prostate. Therefore excision is typically reserved for those patients with bothersome lower urinary tract symptoms such as slow or weak stream, recurrent UTIs or incomplete emptying, and less often in the setting of ejaculatory dysfunction.

**Fertility.** The reproductive potential of hypospadias patients can be impaired by issues with sperm production, sperm quality, and erectile and ejaculatory function. Therefore, when evaluating the fertility potential of men with a history of hypospadias a thoughtful approach is key. **These men should be thoroughly evaluated with a reproductive hormone profile, semen analysis, physical examination (including Tanner stage, meatus location, testicular size/position, curvature etc) and a detailed history.**<sup>37</sup> As many of these patients can have underlying testicular dysfunction, abnormalities in hormone and semen parameters are common.

As a whole, adult men having undergone hypospadias repair as a child do not have impaired semen parameters compared to the general population.<sup>25,38</sup> However, when stratified by the severity of hypospadias phenotype, those with isolated distal hypospadias have better fertility parameters

than proximal hypospadias and hypospadias associated with genital disorders.<sup>25,38,39</sup> **Kumar et al showed that men with proximal hypospadias had decreased semen volume, sperm concentration, sperm motility and morphology as compared to distal hypospadias and controls.**<sup>25</sup> Furthermore, other studies have shown that men with hypospadias, on average, have significantly higher follicle-stimulating hormone/luteinizing hormone and significantly lower testosterone levels.

A population-based cohort study of 1.2 million men in Sweden found that men with both distal and proximal hypospadias had a lower probability of having a biological child. These men also became fathers using assisted reproductive technology significantly more often compared to controls.<sup>40</sup> Örtqvist et al confirmed this analysis reporting lower rates of biological children in men with proximal hypospadias compared to distal hypospadias and controls (19%, 47% and 39%, respectively).<sup>39</sup> Asklund et al in a review of the Danish National Patient Registry noted that 24% of men operated on for hypospadias were registered as having fathered a child versus 29.4% of age matched controls ( $p < 0.01$ ).<sup>38</sup> **It remains uncertain whether the decreased paternity rate is a direct result of underlying subfertility and testicular dysgenesis or possibly related to other concomitant factors such as psychosocial behaviors, sexual dysfunction or associated conditions such as cryptorchidism which can all impact fertility.** Cryptorchidism, especially if bilateral or not corrected early in childhood, is associated with lower sperm concentration and thus may impact fertility.<sup>41</sup> Obviously, any degree of meatal ectopia can impact adequate semen deposition within the vaginal vault, resulting in subfertility and need for assisted reproductive technologies.

## ADULT EVALUATION

Adult hypospadias patients presenting to urologists many years after initial operation do so with a wide range of symptoms and complications. **Given the lack of urological centers providing transitional care from childhood to adulthood and the absence of long-term followup data, it is impossible to determine the true incidence of adult complications after childhood hypospadias repair.** Adult patients with issues related to their repair often feel embarrassed, apprehensive and discouraged about further evaluation as many of them (as many as 66% in a series by Myers et al) have had multiple prior failed repairs during childhood.<sup>42</sup> In order to address this, pediatric urologists should be following hypospadias patients who have had complex or multistage repairs through sexual maturity to detect latent complications and mitigate patient psychosocial barriers to care with patient education.

**These men present most commonly with urethral strictures (45%–72%) with or without lower urinary tract symptoms (50%–82%). Other common complications include urethrocutaneous fistulae (16%–30%), persistent hypospadias (14%–43%), spraying stream (24%), ventral curvature (14%–24%), UTI (15%–25%) or lichen sclerosis (8%–43%). Less commonly adult patients may complain of genitourinary pain (10%), hair-bearing urethral tissue (6%–12%), bladder/urethral stones (2%–3%), infertility (4%) or buried**

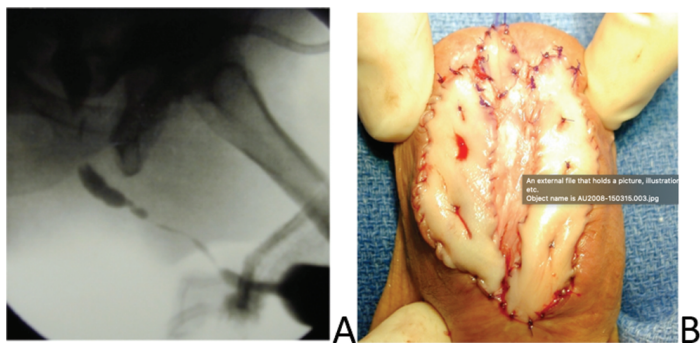


**Figure 3.** A, typical retrograde urethrogram of adult panurethral stricture after hypospadias repair. B, completed first stage urethroplasty with buccal mucosal graft.<sup>48</sup>

**penis (1%; see table).**<sup>42–46</sup> Assessment of these patients can be challenging but these considerations are relevant for the adult urologist in providing appropriate care and management.

There are several important aspects to the evaluation of an adult hypospadias patient. A detailed history including the timing and technique of previous repair(s), any postoperative complications, and initial meatus location is critical in further surgical decision making. Patients are often unaware of their original phenotype and clinical documentation may be incomplete if the elapsed time is great. Physical examination including evaluation of the urinary stream, integrity of ventral shaft skin and glans size is also a key component in the evaluation.

**When a complication is suspected, the diagnostic evaluation should include a noninvasive UF, post-void residual, urine studies and retrograde urethrogram with or without a voiding cystourethrogram. These studies in addition to cystoscopy offer an optimal assessment of the disease process and guide discussions regarding surgical options as well as postoperative expectations.**

Persistent or recurrent lower urinary tract symptoms and UTIs in patients with prior hypospadias repairs can be difficult to manage. Initial workup should be focused on ruling out potential surgically correctable conditions such as strictures, stones, foreign bodies, hair-bearing urethral tissue and incomplete bladder emptying etc. In the absence of any pathology, conservative management is favored. Empiric medical management can include alpha-blockers, with or without anticholinergics, for treatment of obstructive or irritative voiding symptoms. In cases of UTI and associated incomplete bladder emptying, intermittent catheterization may be the answer. Physical therapy and biofeedback can also be utilized to improve pelvic floor muscle relaxation and coordination for dysfunctional voiders. As no two hypospadias patients are alike, a tailored and personalized treatment approach is critical to providing patient centered care. Each patient presents with a different set of symptoms, experiences and preconceptions, and the onus is on physicians to deliver compassionate, empathetic and effective care.

**Urethral stricture is the most common presenting complication in adult patients (~70%) after hypospadias repair.**<sup>42</sup> Strictures may be stratified into panurethral, junctional or bulbar urethral strictures. These strictures differ from

those in the general adult population as they are typically associated with poorer quality tissues and are often longer in length (fig. 3).<sup>43</sup> As such, these patients typically require complex staged surgical interventions to achieve a satisfactory functional result.<sup>47</sup> A “hypospadias cripple” is an erroneous term used to describe men who have sustained several complications and required numerous reoperations. These patients can be especially difficult to repair due to excessive fibrosis, deficiencies in healthy tissue and poor wound healing. **In a study by Hensle et al looking at adult hypospadias patients undergoing reoperation, he found a complication rate of 37.5% in patients with no prior surgery, 41.6% in those with 1 prior surgery and 63.6% in patients with multiple prior repairs.**<sup>46</sup> In fact, Tang et al reported on their limited experience with adult post-hypospadias surgery strictures and found that 22% ultimately received a perineal urethrostomy.<sup>48</sup> Given the complexity of adult hypospadias complications and the subsequent surgical repairs, many if not all patients should be referred to a reconstructive specialist.

## CONCLUSION

In summary, as these children age into adulthood, it is imperative for urologists to be able to identify and diagnose urological problems related to pediatric hypospadias repair. These patients represent a complex cohort exhibiting varying degrees of issues related to urinary, sexual and reproductive function. Objective data collection, standardized validated questionnaires and consistent long-term followup are all essential to enable multi-institution collaboration and further advance the care of patients, particularly the adulthood aspect of their repairs.

## DID YOU KNOW?

- Distal hypospadias repairs have much lower complication rates (5%–15%) compared to proximal hypospadias repairs (35%–68%).
- Hypospadias patients after repair have similar sexual debut, interest in sex, libido and satisfaction with sexual experiences when compared to age matched controls.
- Hypospadias patients have a decreased paternity rate compared to controls, particularly for those with more severe variants.
- The diagnostic evaluation of adult hypospadias patients should include a cystoscopy, noninvasive UF, post-void residual, urine studies and retrograde urethrogram with or without a voiding cystourethrogram.
- Given the complexity of adult hypospadias complications and surgical repairs, most adult patients experiencing complications after pediatric repair should be referred to a reconstructive specialist.

**Table.** Overview of various long-term hypospadias outcomes<sup>49</sup>

| Outcomes                         | Result (%) |
|----------------------------------|------------|
| Lower urinary tract function:    |            |
| Spraying                         | 10–63      |
| Post-void dribbling              | 20–40      |
| Stream deviation                 | 14–28      |
| Lower urinary tract symptoms     | 3–85       |
| Fistulae                         | 0–25       |
| Stricture                        | 0–8        |
| Cosmesis:                        |            |
| Pt dissatisfaction (mostly size) | 7–81       |
| Surgeon dissatisfaction          | 80–97      |
| Psychosexual:                    |            |
| Sexual satisfaction              | 77–100     |
| Curvature                        | 5–23       |
| Erectile difficulties            | 0–73       |
| Ejaculation problems             | 5–36       |

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## Study Questions Volume 41 Lesson 4

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1. The most common short-term complication after hypospadias repair is
  - a. urethrocutaneous fistula
  - b. urethral stricture
  - c. glans dehiscence
  - d. meatal stenosis
2. A 34-year-old man with a history of a proximal hypospadias underwent 2 repairs in childhood. He complains of a progressively weak stream and a sense of incomplete emptying. A post-void residual is 102 ml. His uroflow is flattened with a maximum flow of 6 ml/second. A retrograde urethrogram reveals a pan-urethral stricture. The next step is
  - a. office cystoscopy with sequential urethral dilation
  - b. cystoscopy and direct visual urethrotomy in the operating room
  - c. perineal urethrostomy
  - d. referral to an adult reconstructive urologist
3. A 19-year-old man with a history of a proximal hypospadias and severe chordee repaired in childhood is concerned about his penile length. He reports normal erections, no penile curvature and normal ejaculation. He is a thin young man with a stretched penile length of 12.2 cm. Aside from his penile length he is “satisfied” with the cosmesis and function of his penis. The next step is
  - a. reassurance and counseling
  - b. testosterone cream
  - c. penile prosthesis
  - d. referral to an adult reconstructive urologist
4. A 34-year-old man with a history of proximal hypospadias who underwent repair as a child is now concerned about his fertility potential. He has no issues achieving erections or with ejaculation. On examination his meatus is located at the mid glans and he has a left sided grade 1 varicocele. He is married, his wife is 28 years old and has a child from a previous relationship. Despite having intercourse regularly the past year, they have been unsuccessful in achieving a pregnancy. The next step is
  - a. hormone profile and semen analysis
  - b. testicular biopsy
  - c. varicocelectomy
  - d. advise adoption
5. Compared to ventral lengthening, dorsal plication for the correction of severe chordee in hypospadias is more often associated with
  - a. improved penile sensation
  - b. recurrent curvature
  - c. erectile dysfunction
  - d. urethral stricture